Electronic Curemaster

SERVICE MANUAL

ETS2d (S214d, S221d, S240d)
ETS3d (S310d, S321d)
ETS5d (S516d, S521d)

IF IN ANY DOUBT CONTACT:
EDWIN TRISK LIMITED.

FORM FM 339

ISSUE 09 (VALID FROM 20/10/06)
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IMPORTANT

PLEASE READ THESE INSTRUCTIONS THOROUGHLY BEFORE COMMENCING ASSEMBLY OR OPERATION OF THE UNIT. FAILURE TO DO SO COULD RESULT IN DAMAGE OR INJURY FOR WHICH EDWIN TRISK LIMITED WILL ACCEPT NO RESPONSIBILITY OR LIABILITY.

ISOLATE MAINS SUPPLY BEFORE REMOVING COVERS.

THE SUPPORT ARM EXTENDS FIERCELY WHEN CASSETTE ASSEMBLY IS NOT FITTED.

THIS MANUAL (ISSUE 05) IS ONLY INTENDED FOR THE SERVICING OF THE MODELS MENTIONED ON THE FIRST PAGE.

THIS MANUAL IS AN UNCONTROLLED DOCUMENT. TRISK RESERVE THE RIGHT TO UPDATE UNIT SPECIFICATIONS WITHOUT PRIOR NOTICE OR CONSULTATION.

PLEASE READ THE RELEVANT REPAIR PROCEDURE THOROUGHLY AT LEAST ONCE BEFORE COMMENCING ANY SERVICING OPERATION.

SERVICING OPERATIONS SHOULD ONLY BE CARRIED OUT BY QUALIFIED SERVICE PERSONNEL WHO MUST USE TRISK APPROVED COMPONENTS.

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INTRODUCTION

This manual is intended to aid the servicing of the TRISK branded products listed on the cover. Servicing operations should only be carried out by qualified service personnel, who must use TRISK approved components. Although every effort has been made to ensure that the following information is accurate, it is only intended to help service personnel rather than direct them in their every step. It is vitally important that any problems encountered when servicing units are referred to your importer or Edwin Trisk Ltd.

PLEASE NOTE THAT WHEN SERVICING THE UNIT, REFER TO SECTION 5 - FAULT FINDING GUIDE, BEFORE COMMENCING ANY REPAIR PROCEDURE.

Servicing Tools

The following tools are the minimum required to service the range of products listed on the front cover:

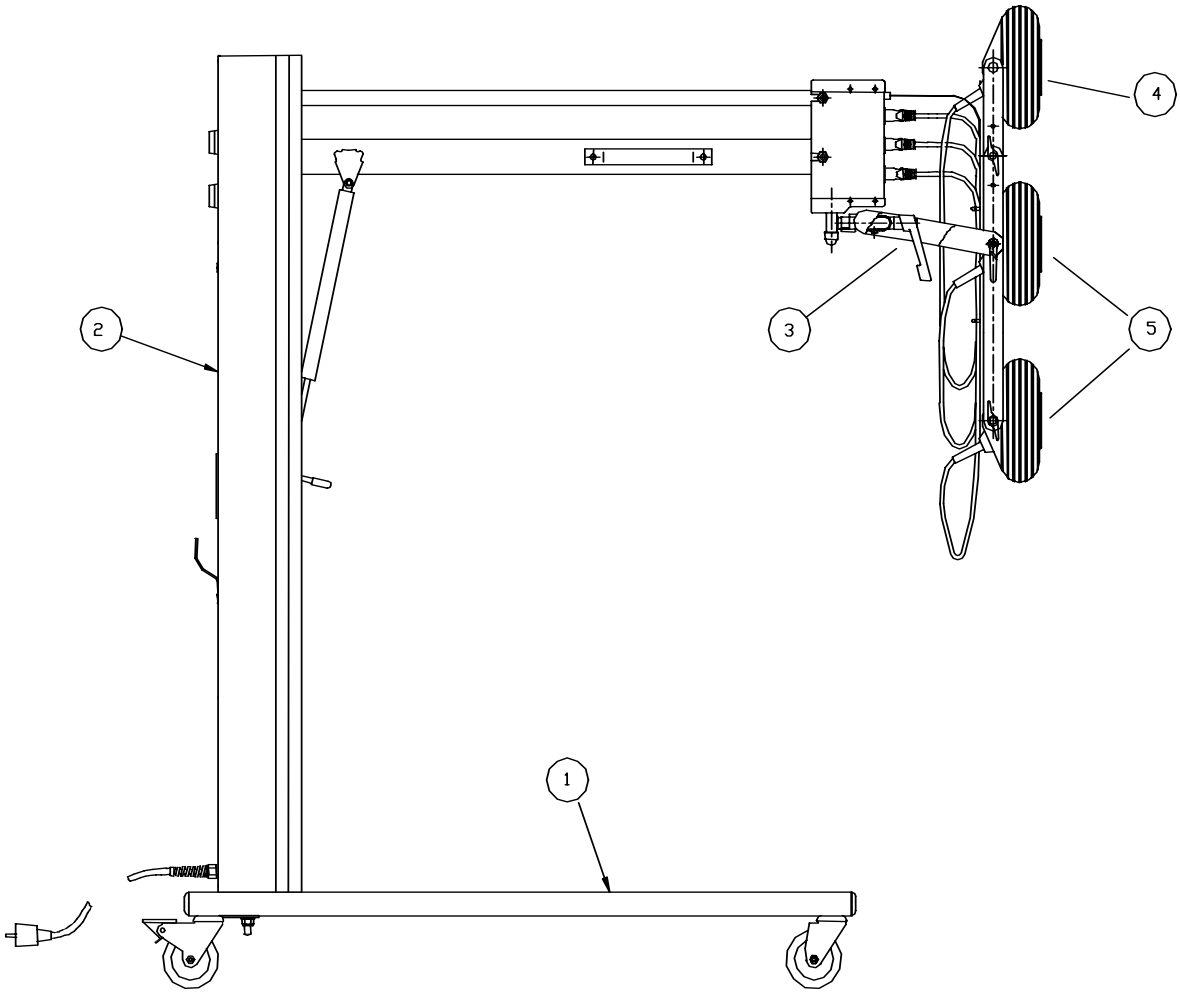
No. Required	Description
1	Round, Parallel Tipped 3mm, Screwdriver
1	Round, Parallel Tipped 5mm, Screwdriver
1	Round, Supadrive No. 1, Screwdriver
2	19mm Combination Spanners
2	17mm Combination Spanners
1	Hand Drill
1	Drill 3mm diameter
1	Combination Pliers
1	Wire Strippers / Cutters
1	Allen Key (6mm AF)
1	Crimp Tool for Crimping Red, Blue and Yellow Insulated Crimp Connections
1	Hand Rivet Gun with nozzle for 3mm rivets.
1	Heyco Hand-pliers

TECHNICAL SPECIFICATIONS

All units use quartz, tungsten filament ruby sleeved Infra-Red Emitters.
All units can operate from a 50Hz or 60Hz mains supply.

ETS214d & ETS240d	
Rated Voltage	240V, Single Phase
Maximum Power Consumption (Nominal)	3000W
ETS221d	
Rated Voltage	230V, Single Phase
Maximum Power Consumption (Nominal)	3300W
ETS310d	
Rated Voltage	240V, Single Phase
Maximum Power Consumption (Nominal)	4500W
ETS321d	
Rated Voltage	400V, Three Phase
Maximum Power Consumption (Nominal)	4500W
ETS516d	
Rated Voltage	240V, Single Phase
Maximum Power Consumption (Nominal)	6000W
ETS521d	
Rated Voltage	400V, Three Phase
Maximum Power Consumption (Nominal)	6600W

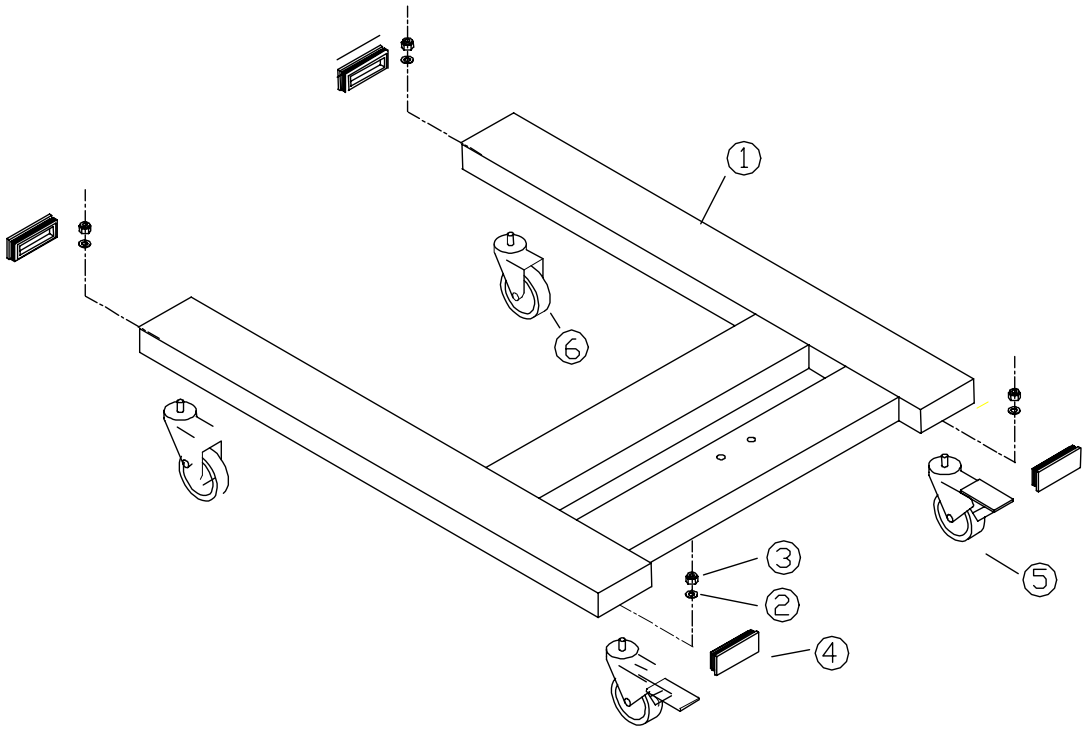
MAJOR COMPONENTS



1 BASE
2 UPRIGHT/ARM ASSEMBLY
3 IR CASSETTE/BACKBAR ASSEMBLY
4 IR CASSETTE – TOP
5 IR CASSETTE – CENTRE & BOTTOM

Base – (All Units)

	PART NUMBER	DESCRIPTION	
1	E214.01	BASE	(S214d)
	E221.01		(S221d, S240d, S310d)
	E321.01		(S321d, S516)
	E521.01		(S521d)
2	S8031	WASHER, M10	
3	S0293A	LOCKNUT, M10 – NYLOC	
4	S0075D	END CAP – PLASTIC	
5	S0065	BRAKED CASTOR	
6	S0064	UNBRAKED CASTOR	

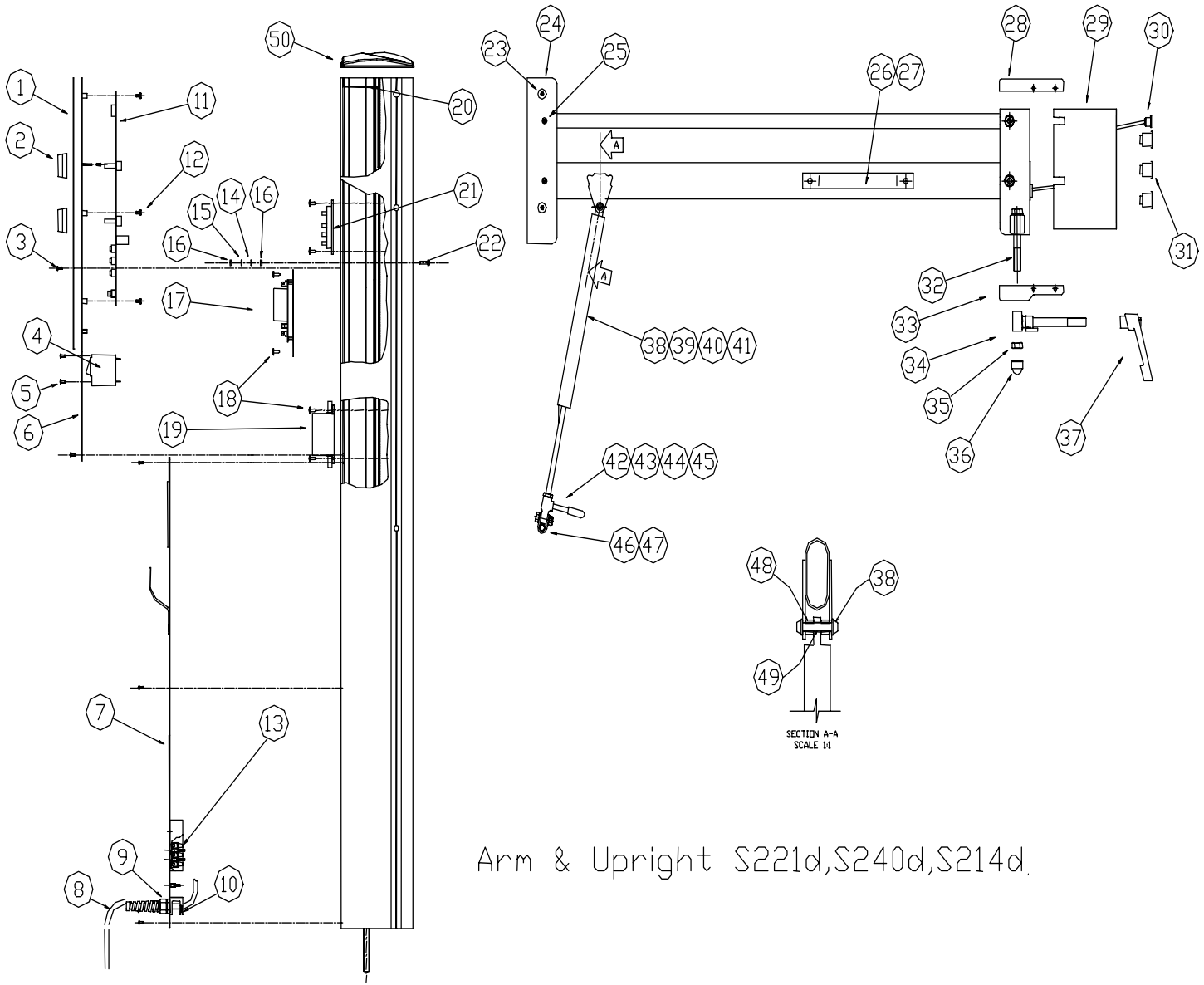


Arm & Upright Assemblies (S214d, S221d, S240d)

1	D220-03-20	Front Panel Fascia Label	
2	S0227	Timer Knob	
3	121.07	No.6 x 3/8” Self Tapping Screw	
4	S0161	15A MCB – Single Pole	
5	S0256	M3 X 8 Taptite P021 Screw	
6	E221.04.05	Front Panel Fascia Metalwork	
7	E214.04.04 E221.04.04 E240.04.04	Mains Cable Input Plate Assembly	(214) (221) (240)
8	S0191 370.08 S0195A	Cable 14AWG 3 Core Cable Cable – Schuko Cord Set Cable 1.5 mm 3 Core	(214) (221) (240)
9	350.01 S0512	Stress Relief Gland	(214) (221,240)
10	351.01 S0513	Gland Nut Con Clamp	(214) (221,240)
11	E221.04.01	Main Control PCB	(221,240)
	E214.04.01		(214)
12	126.10	M4 x 10 Pan-head Screws	
13	S0173C S0174	Connector Block 20A Connector Block 30A	
14	S0308A	M5 Star Washer	
15	S0308	M5 Plain Washer	
16	S0291	M5 Nut	
17	E221.03.03	Transformer PCB Assembly	(Note 1)
18	121.07	No.6 x 3/8 “ Self Tapper	
19	321.06	Single Phase 16A Filter	(221,240)
20	E221.03.25	Top plate – (US units only)	(214)
21	D320.03.15	Universal Power Module (UPM)	
22	S0269	M5 x 16 Bolt	

23	108.04	M10 x 15 Button Head Screw (x4)	
24	PDD003X	Column U-Channel	
25	S8027A	Spiral Pins Ø10 x 50	
26	T1040	Plastic Handle (Large)	
27	S0330	Rivet Ø4.8 x 15	
28	PDD040Y	Top End Cap (Socket Housing)	
29	E221.06.02	Single Socket Housing	(221,240)
	D310.02.01	Single Socket Housing	(214)
30	D320.06.18	Distance Indicator Arm Cable	
31	372.03	IEC Outlet Socket (x3)	
32	S0275	M12 x 90 Bolt	
33	PDD 040X	Bottom End Cap (Skt. Housing)	
34	PDD 131	Pivot Bolt Assembly	
35	S0294A	Nut, M12, Nyloc	
36	S0076	Nut Cap M12	
37	T1011	Ratchet Lever M12 (Female)	
38	177.01	5/16” Capped Starlock	
39	S0112	800N Gas Strut	(214, 221, 240)
40	S0117	Gas Strut Lever	
41	E221.02.01	Gas strut End	
42	S0118	Lever Grip	
43			
44			
45			
46	PDD 011	Pivot Bracket Assembly	
47	PDD033	Gas Strut Pin	
48	194.01	Spacer	
49	D320.03.36	Gas Strut Arm Pin	
50	E221.02.21	Top Cap	

Note On S214d item 17 is to be found at top of upright.



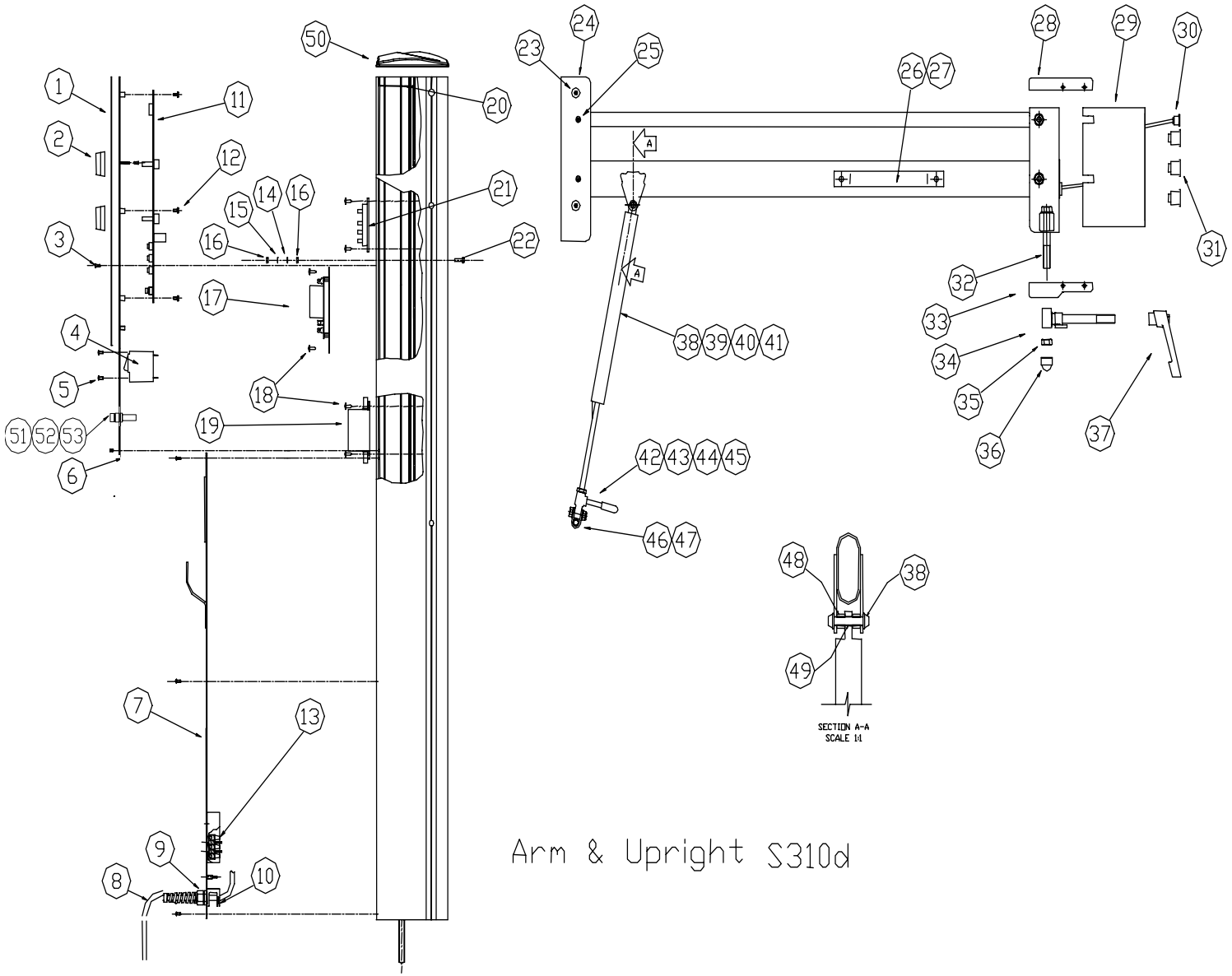
Arm & Upright S221d,S240d,S214d

Arm & Upright Assemblies (S310d)

1	D220-03-20	Front Panel Fascia Label	
2	S0227	Timer Knob	
3	121.07	No.6 x 3/8” Self Tapping Screw	
4	S0162	30A MCB – Single Pole	
5	S0256	M3 X 8 Taptite P021 Screw	
6	E310.04.05	Front Panel Fascia Metalwork	
7	E310.04.04	Mains Cable Input Plate Assembly	
8	S0191A	Cable 10 AWG 3 Core Cable	
9	350.02	Stress Relief Gland	
10	351.02	Gland Nut	
11	E221.04.01	Main Control PCB	
12	126.10	M4 x 10 Pan-head Screws	
13	S0174	Connector Block 30A	
14	S0308A	M5 Star Washer	
15	S0308	M5 Plain Washer	
16	S0291	M5 Nut	
17	E221.03.03	Transformer PCB Assembly	(Note 1)
18	121.07	No.6 x 3/8 “ Self Tapper	
19			
20	E221.03.25	Top plate	
21	D320.03.15	Universal Power Module (UPM)	
22	S0269	M5 x 16 Bolt	
23	108.04	M10 x 15 Button Head Screw (x4)	
24	PDD003X	Column U-Channel	
25	S8027A	Spiral Pins Ø10 x 50	
26	T1040	Plastic Handle (Large)	
27	S0330	Rivet Ø4.8 x 15	

28	PDD040Y	Top End Cap (Socket Housing)
29	D310.02.01	Single Socket Housing
30	D320.06.18	Distance Indicator Arm Cable
31	372.03	IEC Outlet Socket (x3)
32	S0275	M12 x 90 Bolt
33	PDD 040X	Bottom End Cap (Skt. Housing)
34	PDD 131	Pivot Bolt Assembly
35	S0294A	Nut, M12, Nyloc
36	S0076	Nut Cap M12
37	T1011	Ratchet Lever M12 (Female)
38	177.01	5/16” Capped Starlock
39	550.03	1200N Gas Strut
40	S0117	Gas Strut Lever
41	E221.02.01	Gas strut End
42	S0118	Lever Grip
43		
44		
45		
46	PDD 011	Pivot Bracket Assembly
47	PDD033	Gas Strut Pin
48	194.01	Spacer
49	D320.03.36	Gas Strut Arm Pin
50	E221.02.21	Top Cap
51	PDD220	Label ‘Fuse Rating’
52	320.01	Fuse Holder 30A 250Vac
53	S0180A	Fuse, 15A time delay

Note On S310d item 17 is to be found at top of upright.

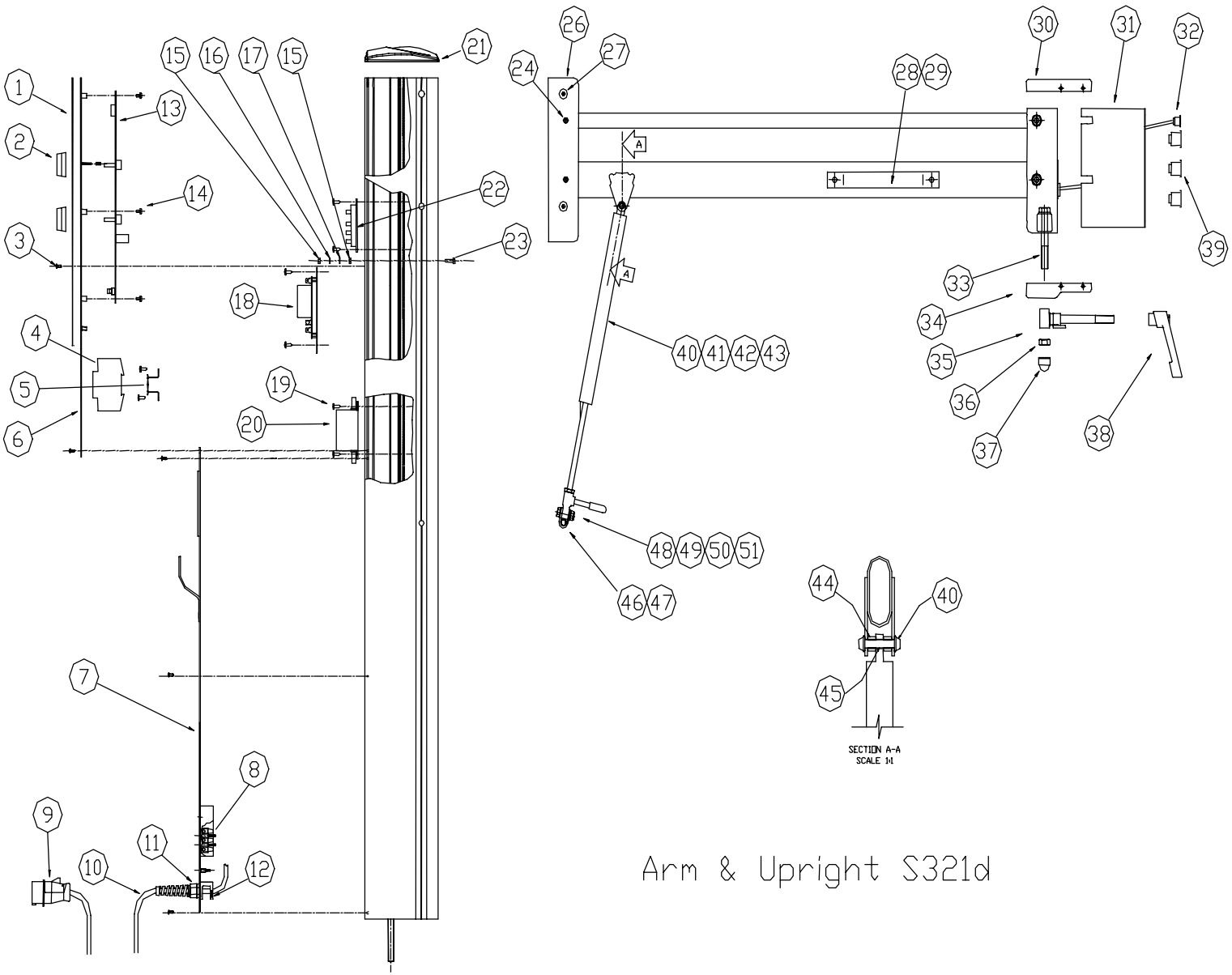


Arm & Upright S310d

Arm & Upright Assemblies (S321d)

1	D320.03.20	Front Panel Fascia Label
2	S0227	Timer Knob
3	121.07	No.6 x 3/8” Self Tapping Screw
4	S0163	10A 3 phase MCB
5	E521.03.22	Breaker Bracket
6	E321.04.06	Front Panel Fascia Metalwork
7	E214.04.04	Mains Cable Input Plate Assembly
8	S0173C	Terminal Block 20A
9	T1050A	Plug – 16A 5Pin CEE17
10	300.10	Cable 1.5mm 4 – Core
11	S0512	Stress Relief Gland
12	S0513	Con Clamp
13	E321.04.01	S321d Main Control PCB
14	126.10	M4 x 10 Pan Head Screws
15	S0291	M5 Nut
16	S0308	M5 Plain Washer
17	S0308A	M5 Star Washer
18	E321.03.03	Transformer Assembly
19	121.07	No.6 x 3/8 “ Self Tapping Screw
20	321.02	3 Phase 16A Mains Filter
21	E221.02.21	Top Cap
22	D320.03.15	Universal Power Module (UPM)
23	S0269	M5 x 16 Bolt
24	S8027A	Spiral Pins Ø10 x 50
26	PDD 003X	Column U-Channel

27	108.04	M10 x 15 Button Head Screw
28	T1040	Plastic Handle Large
29	S0330	Rivet Ø4.8 x 15
30	PDD040Y	Top End Cap (Socket Housing)
31	E221.06.02	Single Socket Housing
32	D320.06.18	Distance Indicator Arm Cable
33	S0275	M12 x 90 Bolt
34	PDD040X	Bottom End Cap (Socket Housing)
35	PDD131	Pivot Bolt Assembly
36	S0294A	Nut M12, Nyloc
37	S0076	Nut Cap M12
38	T1011	M12 Ratchet Lever (Female)
39	372.03	IEC Socket (x3)
40	177.01	5/16” Capped starlock
41	550.03	1200N Gas Strut
42	S0117	Gas Strut Lever
43	E221.02.01	Gas Strut End
44	194.01	Spacer
45	D320.03.36	Gas Strut Arm Pin
46		
47	PDD033	Pin
48	S0118	Lever Grip
49		
50		
51		

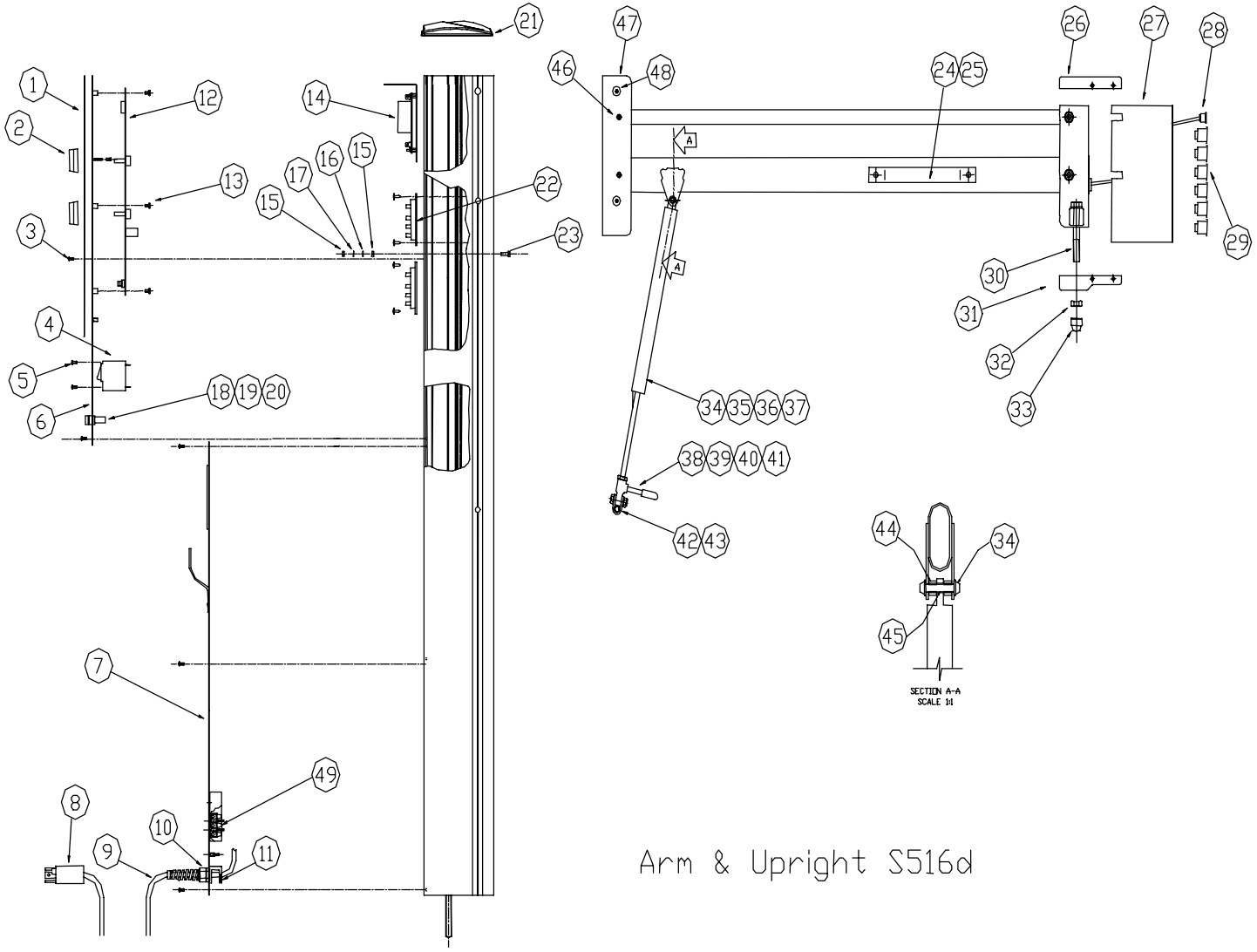


Arm & Upright S321d

Arm & Upright Assemblies (S516d)

1	E521.04.23	Front Panel Fascia Label
2	S0227	Timer Knob
3	121.07	No.6 x 3/8” Self Tapping Screw
4	S0162	MCB 1 Phase 30A
5	S0256	M3 x 8 Taptite Pozi Screw
6	E516.04.05	Front Panel Fascia Metalwork
7	E516.04.04	Mains Cable Input Plate Assembly Inc Cable
8	S0240B	Plug Hubble Twist Lock 30A
9	S0191A	Cable – 10AWG 3 Core
10	350.08	Stress Relief Gland
11	351.02	Gland Nut
12	E221.04.01	Main Control PCB
13	126.10	M4 x 10 Panhead Screws
14	E221.03.03	Transformer PCB Assembly
15	S0291	M5 Nut
16	S0308A	M5 Star Washer
17	S0308	M5 Plain Washer
18	320.01	Fuse Holder, 30A 250V
19	S0180A	Fuse 15A Time Delay
20	S0217B	Heatshrink Sleeving 6.4dia
21	E221.02.21	Top Cap
22	D320.03.15	Universal Power Module (UPM)
23	S0269	M5 x 16 Bolt
24	T1040	Plastic Handle (Large)
25	S0330	Rivet Ø4.8 x 15

26	PDD040Y	Top End Cap (Socket Housing)
27	E516.06.03	Socket Housing Cover
28	D320.06.18	Distance Indicator Arm Cable
29	372.03	IEC Outlet Socket (x6)
30	S0275	M12 x 90 Bolt
31	01.04.07	Bottom End Cap (Socket Housing)
32	S0294A	M12 Nut, Nyloc
33	S0076	M12 Nut Cap
34	177.01	5/16” Capped Starlock
35	S0115	1500 N Gas Strut
36	S0117	Gas Strut Lever
37	E221.02.01	Gas Strut End
38	S0118	Lever Grip
39		
40		
41		
42		
43	PDD033	Pin
44	194.01	Spacer
45	D320.03.36	Gas Strut Arm Pin
46	S8027A	Spirol pin
47	PDD003X	Column U-Channel
48	108.04	M10 x 15 Button Head Screw (x4)
49	S0174	Connector block 30A

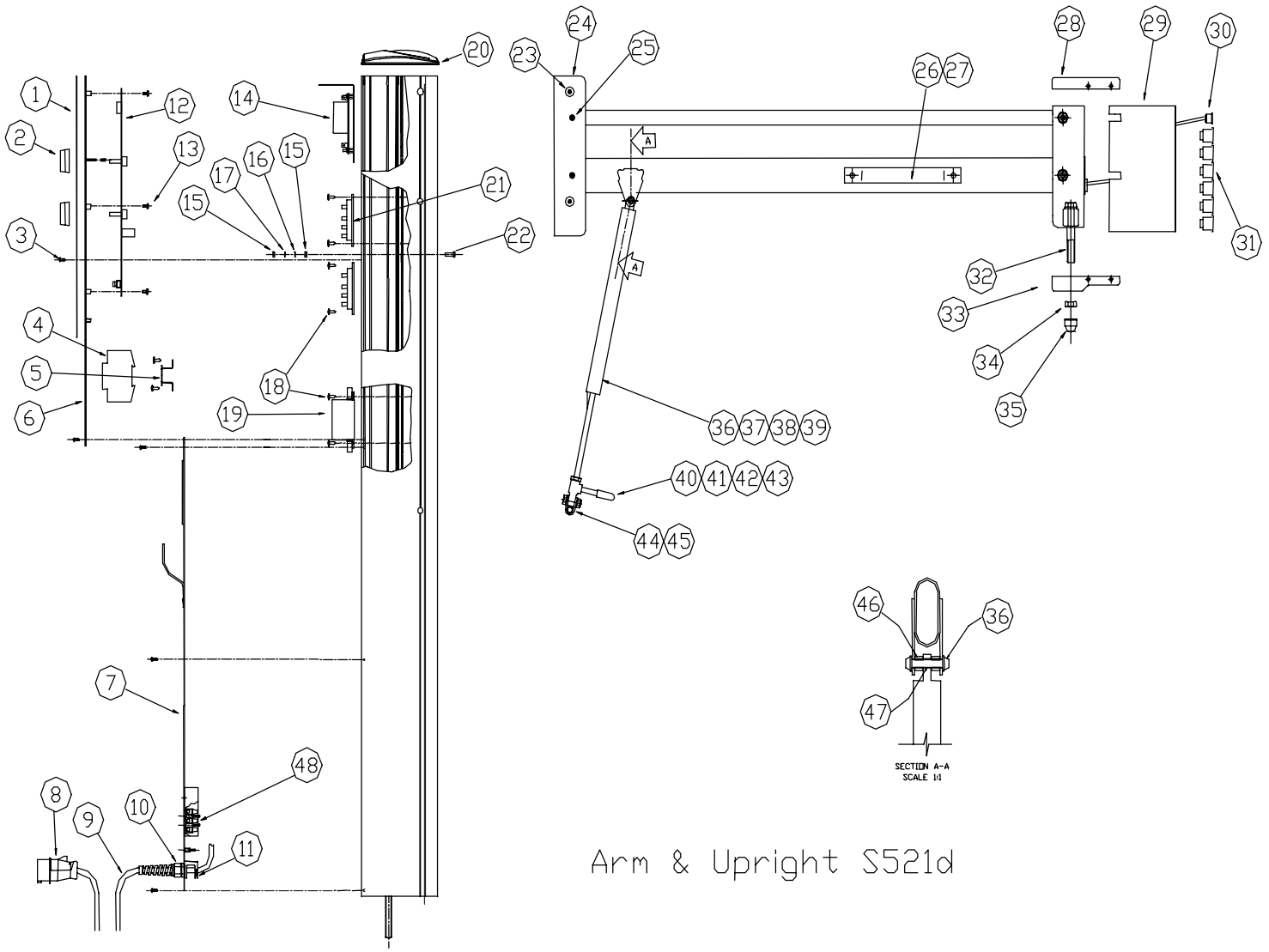


Arm & Upright S516d

Arm & Upright Assemblies (S521d)

1	E521.04.23	Front Panel Fascia Label
2	S0227	Timer Knob
3	121.06	No.6 x 3/8” Self Tapping Screw
4	S0163	MCB 3 Phase 10A
5	E521.03.22	MCB Bracket
6	E521.04.06	Front Panel Fascia Metalwork
7	E521.04.04	Mains Cable Input Plate Assembly, Inc Cable
8	T1050A	Plug 5 Pin CEE17
9	300.10	Cable 1.5mm² 3-core H05-VV-F4
10	S0512	Stress Relief Gland
11	S0513	Con Clamp
12	E521.04.01	E521 Main Control PCB
13	126.10	M4 x 10 Panhead Screws
14	E521.03.03	Transformer PCB Assembly
15	S0291	M5 Nut
16	S0308A	M5 Star Washer
17	S0308	M5 Plain Washer
18	121.06	No.6 x 3/8” Self Tapping Screw
19	321.08	3Phase 16A Mains Filter
20	E221.02.21	Top Cap
21	D320.03.15	Universal Power Module (UPM)(x2)
22	S0269	M5 x 16 Bolt
23	108.04	M10 x 15 Button Head Screw (x4)
24	PDD003X	Column U-Channel

25	S8027A	Spiral Pin Ø10 x 50
26	T1040	Plastic Handle (Large)
27	S0330	Rivet Ø4.8 x 15
28	PDD040Y	Top End Cap (Socket Housing)
29	E521.06.02	6 Outlet Socket Housing
30	D320.06.18	Distance Indicator Arm Cable
31	372.03	IEC Outlet Socket (x6)
32	S0275	M12 x 90 Bolt
33	PDD040X	Bottom End Cap (Socket Housing)
34	S0294A	M12 Nut, Nyloc
35	S0076	M12 Nut Cap
36	177.01	5/16” Capped Starlock
37	S0115	1500 N Gas Strut
38	S0117	Gas Strut Lever
39	E221.02.01	Gas Strut End
40	S0118	Lever Grip
41		
42		
43		
44		
45	PDD033	Pin
46	194.01	Spacer
47	D320.03.36	Gas Strut Arm Pin
48	S0173C	Terminal Block (20A)



Arm & Upright S521d

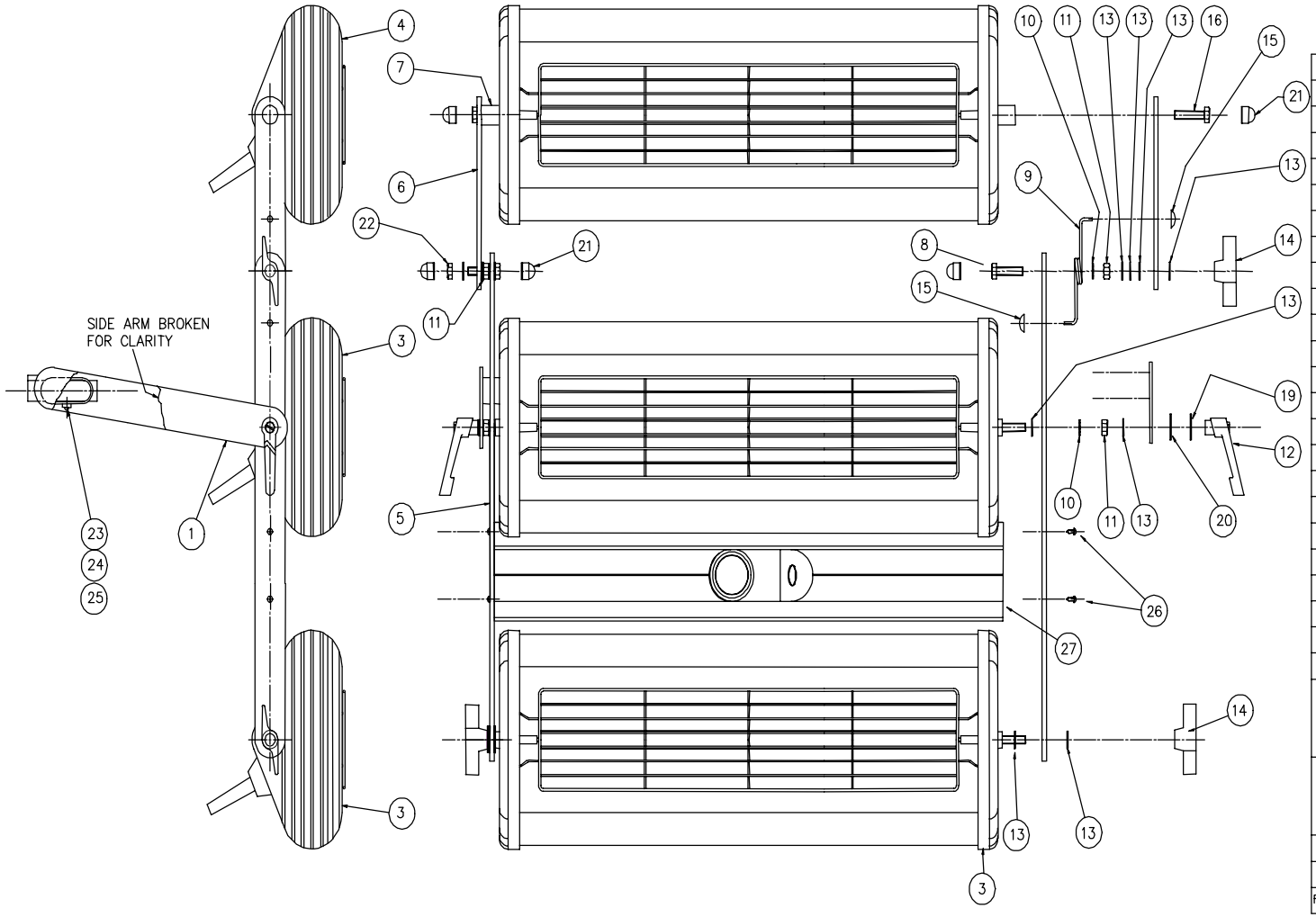
Cassette Assembly (S221d, S240d, S214d)

TIGHTENING TORQUES: –

16 TORQUE 23 lb.ft. = 31Nm

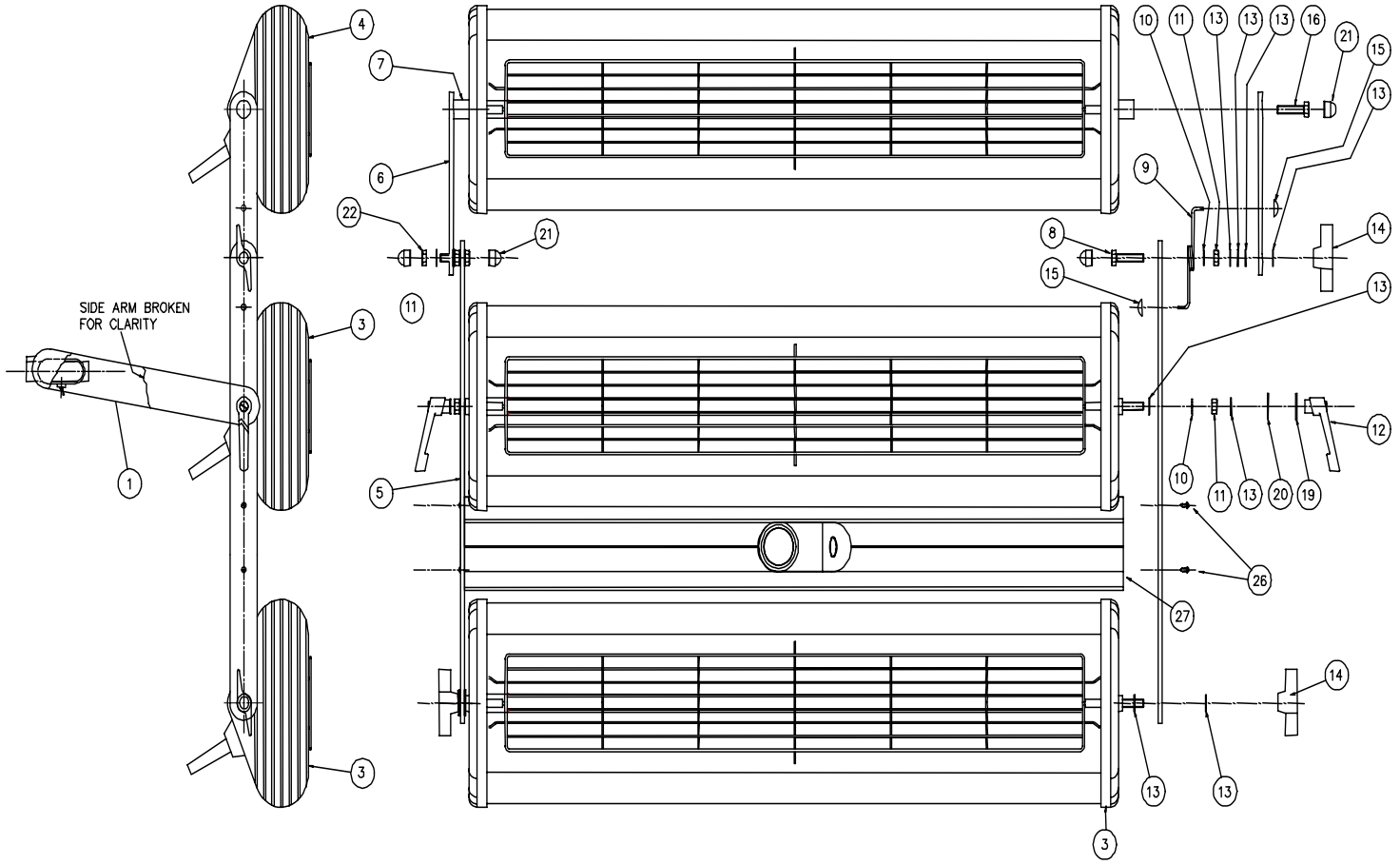
11 TORQUE 23 lb.ft. = 31Nm

22 TORQUE 10 lb.ft. = 13.5Nm



REF	PART No.	DESCRIPTION	MATL.	QTY.
28				
27	D220-05-02	DISTANCE INDICATOR ASSEMBLY		1
26	S0256	M3x8 BLACKENED POZI TAPTITE	STEEL	4
25	S0220	CABLE TIE	NYLON	1
24	S0328A	RIVET, ø3.2 x 8	ALUM	1
23	395.03	MOUNT,CABLE TIE	NYLON	1
22	S0292B	M8 BINX NUT	STEEL	1
21	S0077	M8 NUT CAP	PLASTIC	5
20	157.01	FIBRE WASHER	FIBRE	2
19	152.01	WASHER	STEEL	2
18	PDD035Z	CASSETTE PACKING SEQUENCE (LONG TUBE)		1
17				
16	S0273	M8 x 50 HEXAGON HEAD SCREW	STEEL	2
15	177.03	1/8" CAPPED SPIDERFIX	STEEL	2
14	S0087A	WING KNOB M8 FEMALE	ST/PL	3
13	S0312	PLAIN WASHER M8	STEEL	16
12	S0087B	RATCHET LEVER M8 FEMALE	ST/ZN	2
11	S8054	NUT M8	STEEL	4
10	S0321A	SHAKEPROOF WASHER M8	STEEL	4
9	PDD034X	SIDE BRACKET SPRING (RH)	STEEL	1
8	S8040	M8 x 30 BOLT	STEEL	2
7	PDD36X	SPACER	STEEL	2
6	PDD014Y	SIDE BRACKET,SHORT	ALUM.	2
5	D320-05-20	ETS2/3d SIDE BRACKET,LONG	ALUM.	2
4	D221-07-01	ETS2d CASSETTE ASSY (S221d)		1
	D240-07-01	ETS2d CASSETTE ASSY (S240d)		
	PPA008Y	ETS2d CASSETTE ASSY (S214d)		
3	D221-07-02	ETS2d CASSETTE ASSY (S221d)		2
	D240-07-02	ETS2d CASSETTE ASSY (S240d)		
	PPA008W	ETS2d CASSETTE ASSY (S214d)		
2				
1	PDD 132	BACKBAR BRACKET (LONG)	---	1

Cassette Assembly (S310d, S321d)



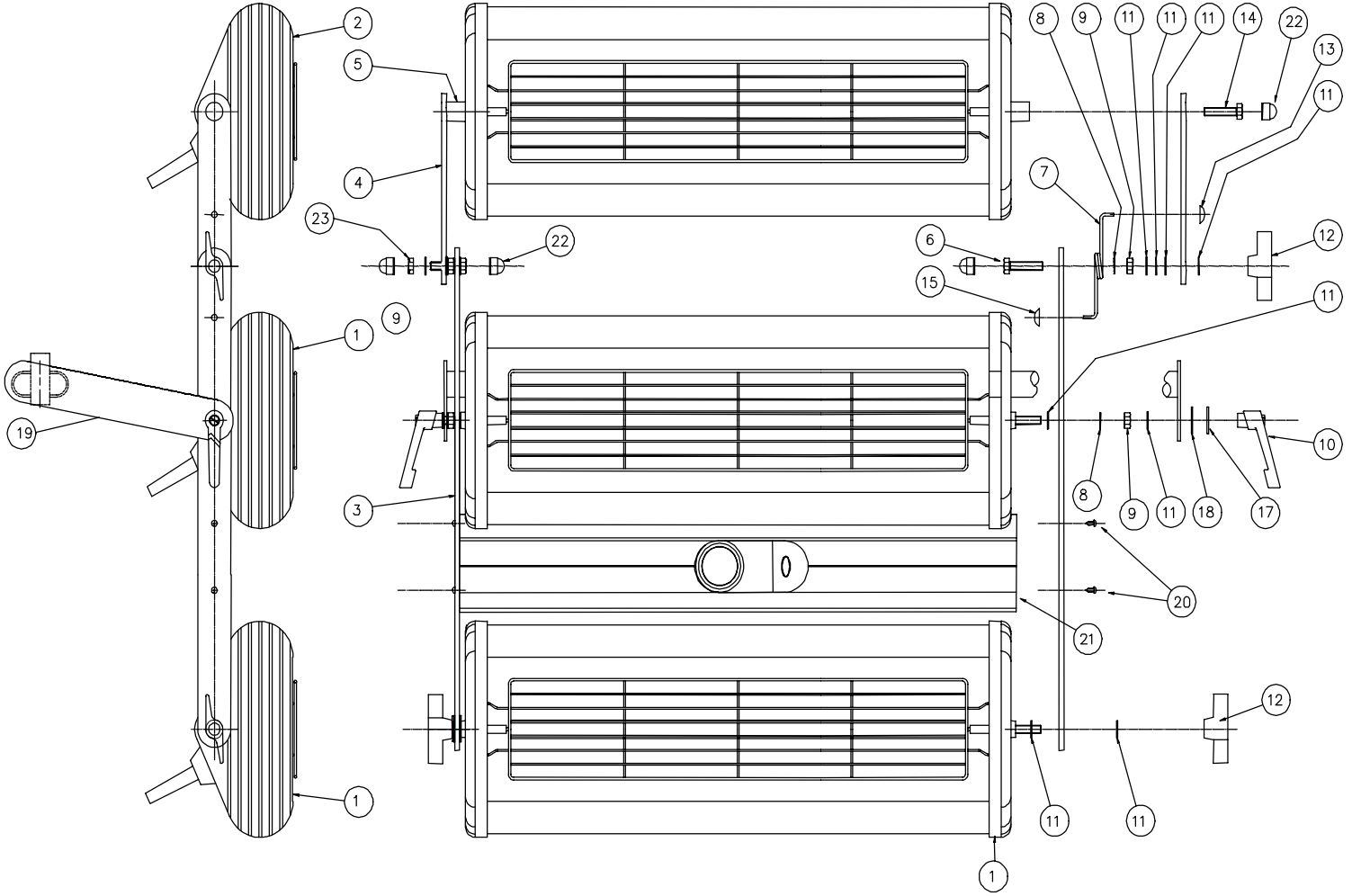
TIGHTENING TORQUES: –

(16) TORQUE 23 lb.ft.

(11) TORQUE 23 lb.ft.

REF	PART No.	DESCRIPTION	MATL.	QTY.
28				
27	D321-05-01	DISTANCE INDICATOR ASSEMBLY		1
26	S0256	M3x8 BLACKENED POZI TAPTITE	STEEL	4
25				
24				
23				
22	S0292B	M8 BINX NUT	STEEL	1
21	S0077	M8 NUT CAP	PLASTIC	5
20	157.01	FIBRE WASHER	STEEL	2
19	152.01	WASHER	STEEL	2
18	S330-00-02	CASSETTE PACKING SEQUENCE (VERY LONG TUBE)		1
17				
16	S0273	M8 x 50 HEX HEAD SCREW	STEEL	2
15	177.03	1/8" CAPPED SPIDERFIX	STEEL	2
14	S0087A	WING KNOB M8 FEMALE	ST/PL	3
13	S0312	PLAIN WASHER M8	STEEL	16
12	S0087B	RATCHET LEVER M8 FEMALE	ST/ZN	2
11	S8054	NUT M8	STEEL	4
10	S0321A	SHAKEPROOF WASHER M8	STEEL	4
9	PDD034X	SIDE BRACKET SPRING (RH)	STEEL	1
8	S8040	M8 x 30 BOLT	STEEL	2
7	PDD36X	SPACER	STEEL	2
6	PDD014Y	SIDE BRACKET,SHORT	ALUM.	2
5	D320-05-20	ETS2/3d SIDE BRACKET,LONG	ALUM.	2
4	D321-07-01	ETS3d CASSETTE ASSY (S321d)	---	1
	S310-05-01	ETS3d CASSETTE ASSY (S310d)	---	1
3	D321-07-02	ETS3d CASSETTE ASSY (S321d)	---	2
	S310-05-02	ETS3d CASSETTE ASSY (S310d)	---	2
2				
1	S360-06	BACK BAR ASSY. ETS3		1

Cassette Assembly (S516d, S521d)



TIGHTENING TORQUES:–

(14) TORQUE 23 lb.ft. = 31.86Nm

(9) TORQUE 23 lb.ft. = 31.86Nm

REF	PART No.	DESCRIPTION	MATL.	QTY.
23	S0292B	M8 BINX NUT	STEEL	1
22	S0077	M8 NUT CAP	PLASTIC	5
21	D220-05-02	DISTANCE INDICATOR ASSEMBLY		1
20	S0256	M3x8 POZI TAPTITE	STEEL	4
19	E521-07-05	BACKBAR ASSEMBLY – LONG	STEEL	1
18	157.01	FIBRE WASHER		2
17	152.01	WASHER	STEEL	2
16	PDD035Z	CASSETTE PACKING SEQUENCE (LONG TUBE)		1
15				
14	S0273	M8 x 50 HEX HEAD SCREW	STEEL	2
13	177.03	1/8" CAPPED SPIDERFIX	STEEL	2
12	S0087A	WING KNOB M8 FEMALE	ST/PL	3
11	S0312	PLAIN WASHER M8	STEEL	16
10	S0087B	RATCHET LEVER M8 FEMALE	ST/ZN	2
9	S8054	NUT M8	STEEL	4
8	S0321A	SHAKEPROOF WASHER M8	STEEL	4
7	PDD034X	SIDE BRACKET SPRING (RH)	STEEL	1
6	S8040	M8 x 30 BOLT	STEEL	2
5	PDD36X	SPACER	STEEL	2
4	PDD014Y	SIDE BRACKET,SHORT	ALUM.	2
3	D320-05-20	ETS2/3d SIDE BRACKET,LONG	ALUM.	2
2	PPA 034	ETS2d CASSETTE ASSY (S521d)	---	1
	PPA008Y	ETS2d CASSETTE ASSY (S510d)	---	1
1	PPA 035	ETS2d CASSETTE ASSY (S521d)	---	2
	PPA008W	ETS2d CASSETTE ASSY (S510d)	---	2

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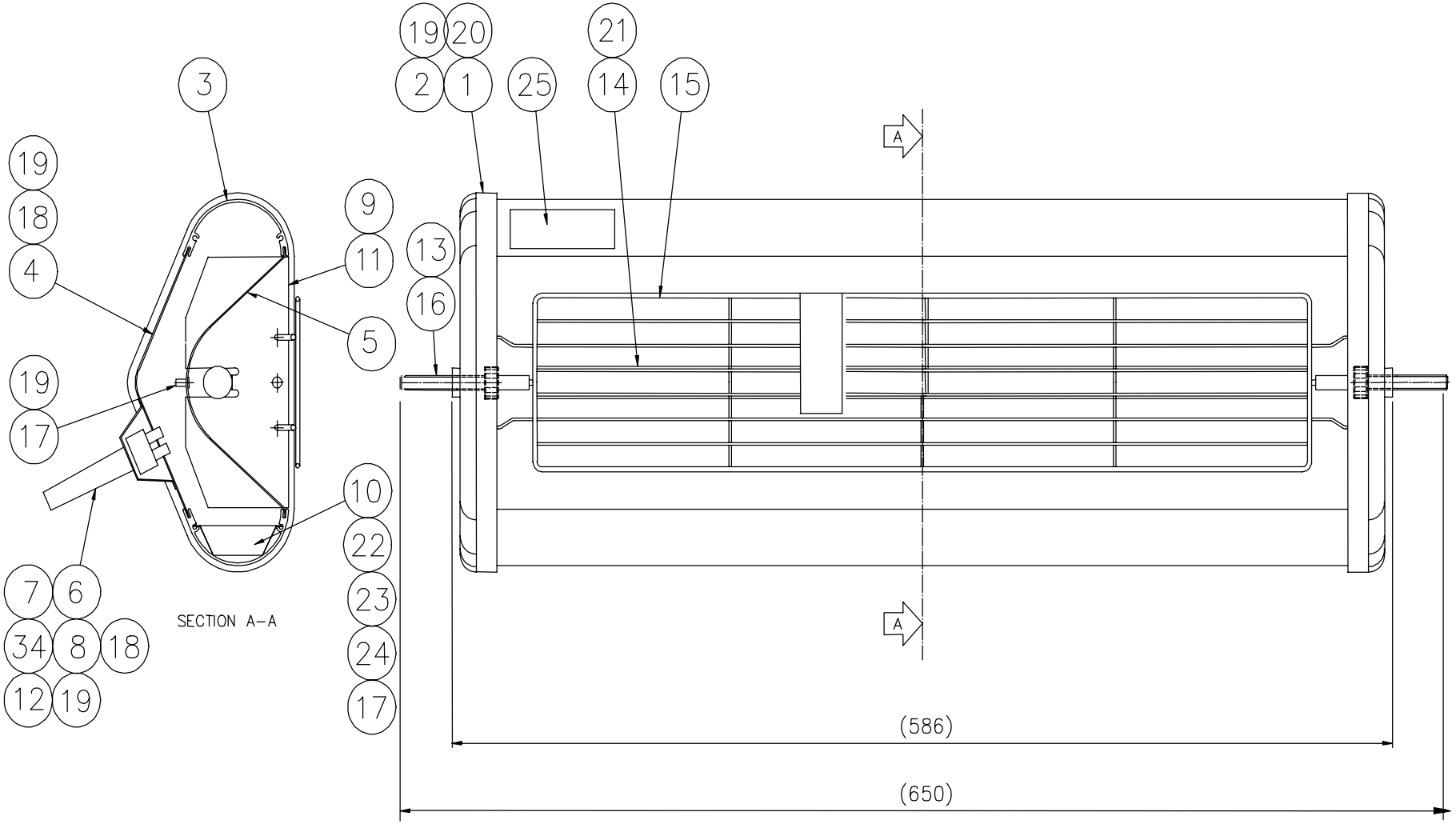
I R Cassette Assembly (S214d, S221d, S240d, S516d, S521d)

1	PDD 072	Die Cast End Cap	2
2	S0251	Screw, Pozi-pan, Self-tapping	8
3	PDD 006Y	Cassette Side Extrusion	2
4	PDD 006W	Cassette Back	1
5	PDD 007X	Back Reflector, long	1
6	CM01.05.20	Strain Relief Plate	1
7	350.05	Flexi-strain Relief Grommet	1
8	S0173C	Terminal Block, 3-way, 20A	1
9	S0256	Screw, Pozi-taptite	3
10	PDD 082	Cassette Cable Tray	1
11	PDD 021	Side Reflector	2
12	370.05 370.20	Plug/Cordset (S221d, S240d) Plug/Cordset (S214d, S516d, S521d)	1
13	S0321A	Washer, M8, Shakeproof (NUT FIX ONLY)	1
14	380.08 380.07	Infrared Emitter Tube, 230V, 1100W (S221d, S521d) Infrared Emitter Tube, 240V, 1000W (S214d, S240d, S516d)	1
15	PDD 161 PDD 005X	Grille (S221d Grille (S214d	1
16	S 8049	Socket head cap Screw, M8x50 (NUT FIX ONLY)	2
17	S0332	Rivet Ø3.2 x 8	4
18	S0328A	Rivet Ø3.2 x 8 (Black)	6
19	S0309	Shakeproof Washer M3	4

20	S8008	Cable clip	2
21	S0561H	Tube packer	3
22	S0220A	Snap-in Cable Tie	4
23	395.02	Cable Tie Base	1
24	S0220	Cable Tie	1
25	PDD 196	Label – ‘ISOLATE MAINS’	1
26	S0211B	Male Insulated Coupler	2
27	S0212	Shrouded Receptacle - red	2
28	301.24 S0206	Cable 1.0mm Brown, High Temp. (S226d, S240d, S521d) Cable 1.0mm Brown Tri-Rated. (S214d, S516d)	600mm
29	301.25 S0205	Cable 1.0mm Blue High Temp. (S226d, S240d, S521d) Cable 1.0mm Blue Tri-Rated (S214d, S516d)	390mm
30	301.26 S0205B	Cable 1.0mm Grn/Yel High Temp. (S226d, S240d, S521d) Cable 1.0mm Grn/Yel Tri-Rated (S226d, S240d, S521d)	600mm
31	S0210	M3 Red Ring Crimp Terminal	7
32	S0217	Heatproof Sleeving	100mm
33	S0215	Red Blade Crimp Terminal	4
34	S0349	Terminal Block Retaining Pin	1
35	385.01	Heatproof Sleeving 3Ø	450mm
36	PDD 166	Label – ‘CAUTION, REMOVE PACKING’	1

I R Cassette Assembly (S214d,S221d,S240d,S516d,S521d)

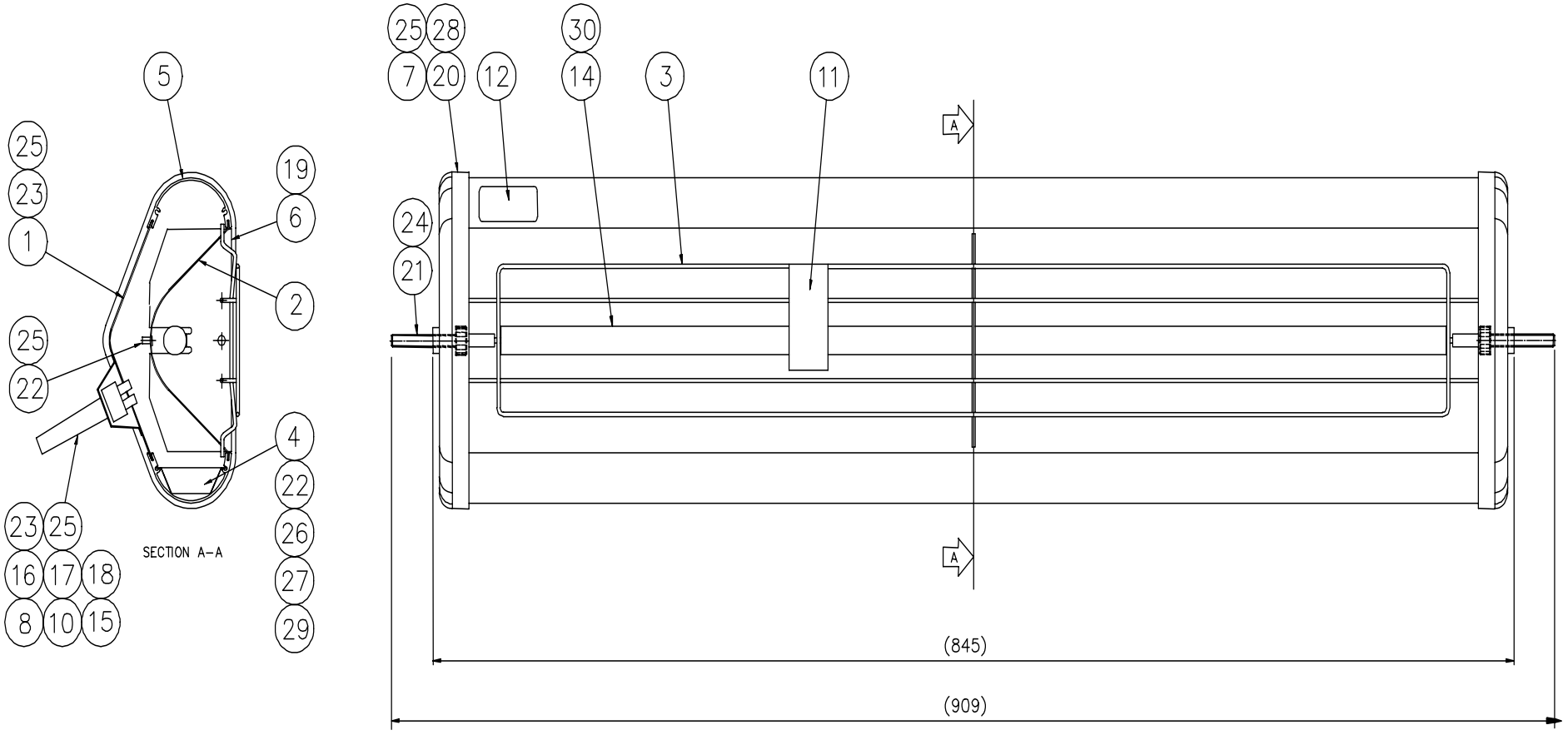


I R Cassette Assembly (S310d, S321d)

1	S330.05.20	Cassette back	1
2	S330.05.21	Back Reflector	1
3	S330.05.22	Grille (S310d)	1
	S320.05 20	Grille (S321d)	
4	S330.05.23	Cassette Cable Tray	1
5	S330.05.24	Cassette Side Extrusion	2
6	PDD 021	Side Reflector	2
7	PDD 072	Die Cast End Cap	2
8	CM01.05.20	Strain Relief Plate	1
10	PDD 026	Label – 'INSPECTED BY'	1
11	PDD 167	Label – 'CAUTION, REMOVE	1
		PACKING'	
12	PDD 041	Label - "ISOLATE MAINS"	1
13			
14	380.11	Infrared Emitter Tube, 240V	1
		1500W	
15	370.05	Plug/Cordset	1
16	S0173C	Terminal Block, 3-way, 20A	1
17	S0349	Terminal block retaining pin	1
18	350.05	Flexi-strain Relief Grommet	1
19	S0256	Screw, Pozi-taptite M3x8	3
20	S0251	Screw, Pozi-pan, Self Tapping	8
21	S8049	Socket headcap Screw	2
		(NUT FIX ONLY)	

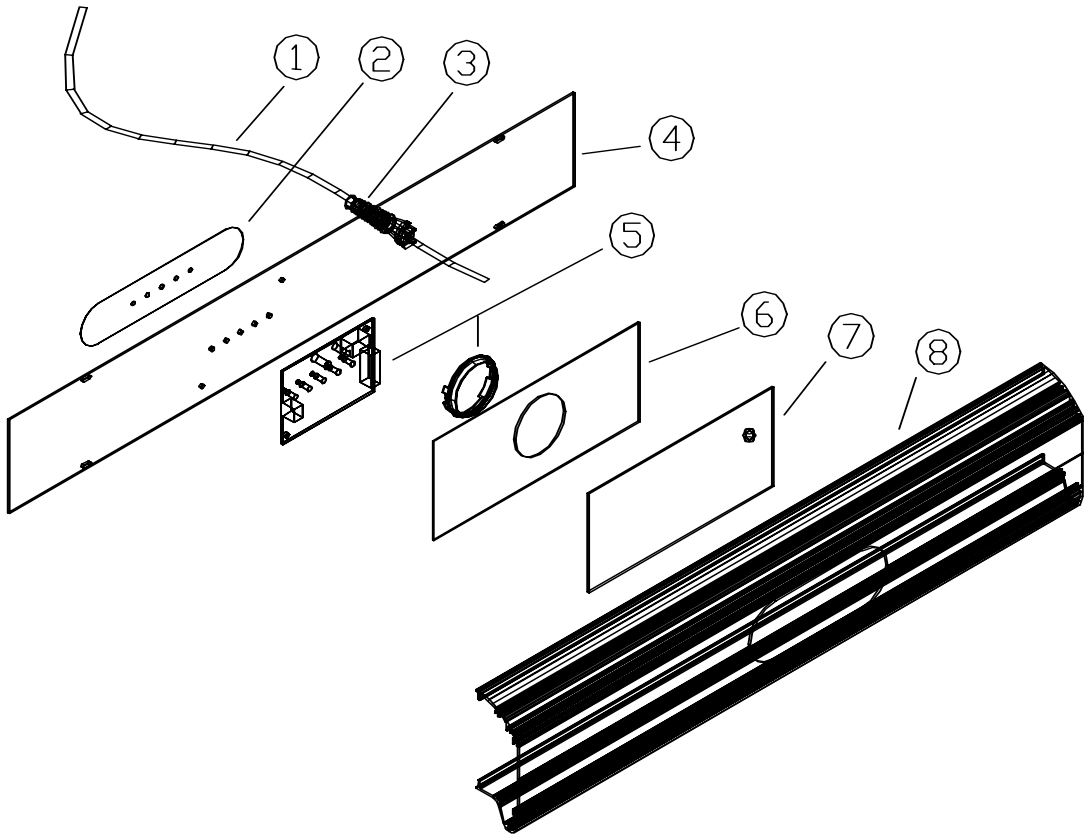
22	S0332	Rivet Ø3.2x8	2
23	S0328A	Rivet Ø 3.2 x 8 (Black)	6
24	S0321A	Washer, shakeproof M8	2
		(NUT FIX ONLY)	
25	S0309	Washer shakeproof M3	4
26	395.02	Cable Tie Base	1
27	S0220	Cable Tie	1
28	S8008	Cable Clip	1
29	S0220A	Snap-in Cable Tie	6
30			
31			
32	S0211B	Red Male Coupler	2
33	S0212	Red Shrouded Receptacle	2
34	S0210	M£ Red Ring	
35	S0215	Red Blade	
36	S0206	Cable 1.0mm Brown Tri-Rated (S310d)	730mm
	301.24	Cable 1.0mm Brown High Temp (S321d)	
37	S0205	Cable 1.0mm Blue Tri-Rated (S310d)	520mm
	301.25	Cable 1.0mm Blue High Temp (S321d)	
38	S0205B	Cable 1.0mm Grn/Yel Tri-Rated (S310d)	730mm
	301.26	Cable 1.0mm Grn/Yel High Temp (S321d)	
39	385.01	Heatproof Sleeve Ø3	450mm
40	S0217	Heatproof SLeeve Ø6	100mm

I R Cassette Assembly (S310d,S321d)



Distance Indicator Exploded Assembly

1	D220.05.18	Distance indicator cable assembly
2	D220.05.20	Distance indicator label
3	S8007	Cable strain relief gland
4	D320.05.12	Back-plate assembly (inc. items 1,2,3,4) (S214, S221, S240, S516, S521)
	D321.05.02	Back-plate assembly (Inc items 1,2,3,4) (S310, S321)
5	D320.05.03	Distance indicator PCB
6	D320.05.25	Sensor mounting plate
7	D320.05.10	Sliding cover assembly
8	D220.05.22	Distance indicator extrusion (S214, S221, S240, S516, S521)
	D320.05.22	Distance indicator extrusion (S310, S321)



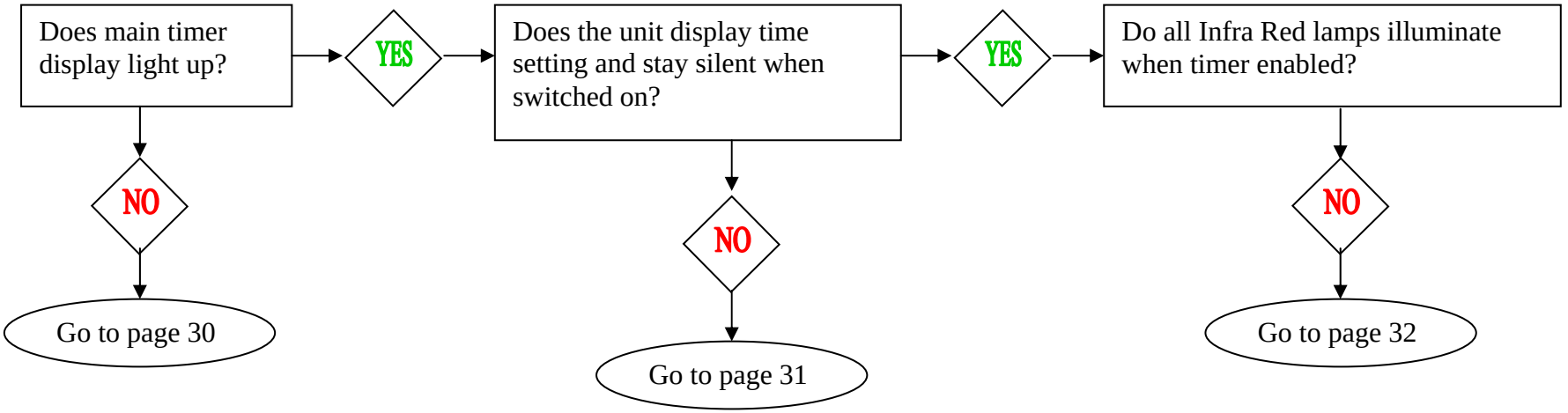
FAULT FINDING GUIDE

Fault:
INFRA RED EMITTERS WILL NOT TURN OFF or INFRA RED EMITTERS TURN ON IMMEDIATELY THE MAIN POWER SWITCH IS TURNED ON.
The Universal Power Module (UPM) has failed. See procedure 1 - Front Panel Removal and procedure 4 - UPM Replacement.

Fault:
ARM WILL NOT RAISE OR LOWER
Gas Strut Locknut slack, causing unit to jam. To reset, rotate Gas Strut Shaft one half turn clockwise and check operation with release arm. Continue this operation until a position is obtained which allows the arm to move freely up and down when the Gas Strut Lever is depressed. Tighten Locknut.

If examination of the Gas Strut reveals damage to the unit e.g. Bent Shaft, see procedure 7, Gas Strut Replacement.

FAULT FINDING FLOW DIAGRAM


Does main timer display light up?
YES
Does the unit display time setting and stay silent when switched on?
YES
Do all Infra Red lamps illuminate when timer enabled?
NO
Go to page 30
NO
Go to page 31
NO
Go to page 32

Hints and Tips

When checking for connection or wiring faults, try moving and bending the wire around. An insecure connection will give an intermittent fault.

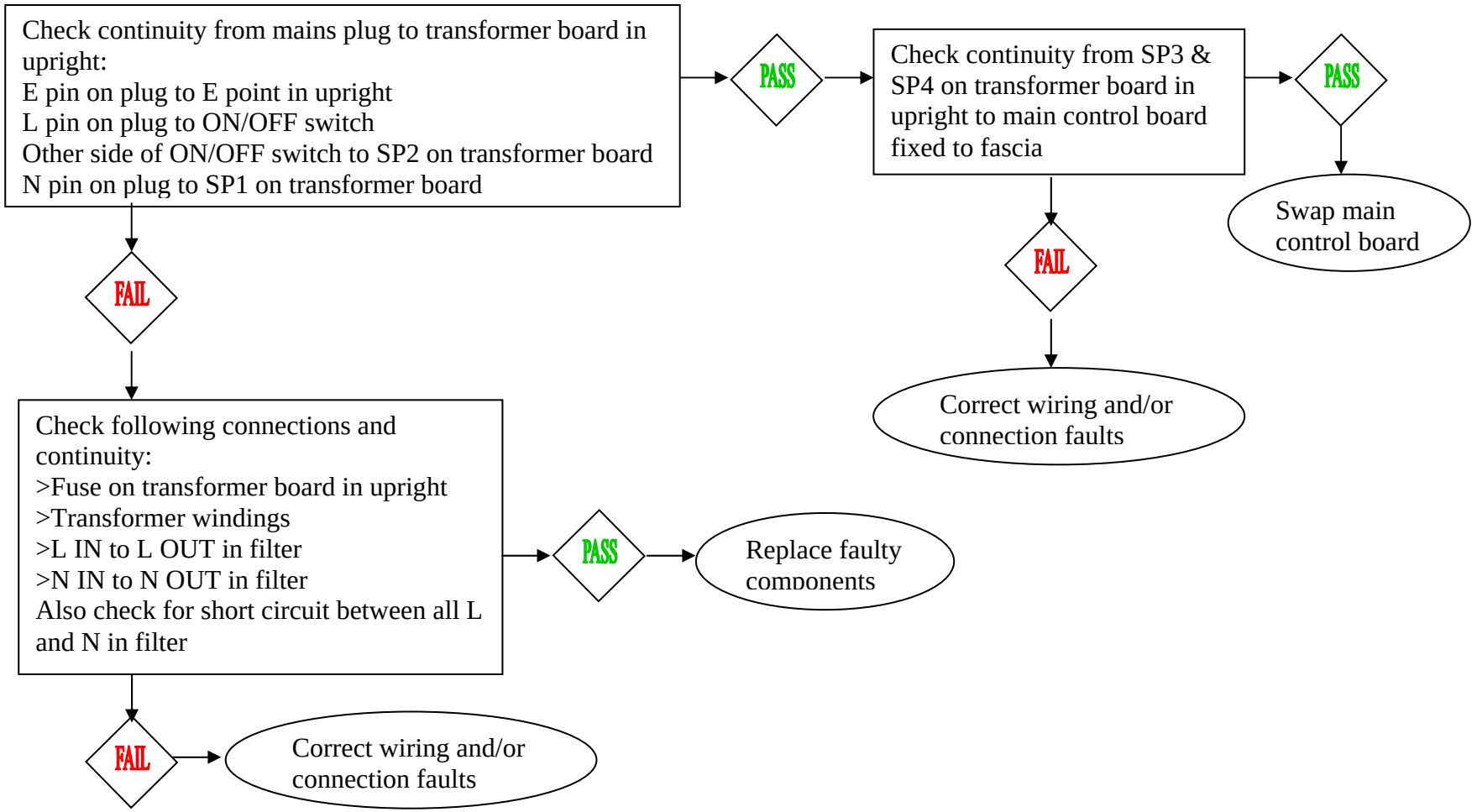
If all the wiring seems to be good, check the circuit boards for dry or cracked solder joints.

Severe bends and kinks in cables are prone to snapping interior wiring. Melted outer shielding of the mains cable may also be a cause of malfunction.

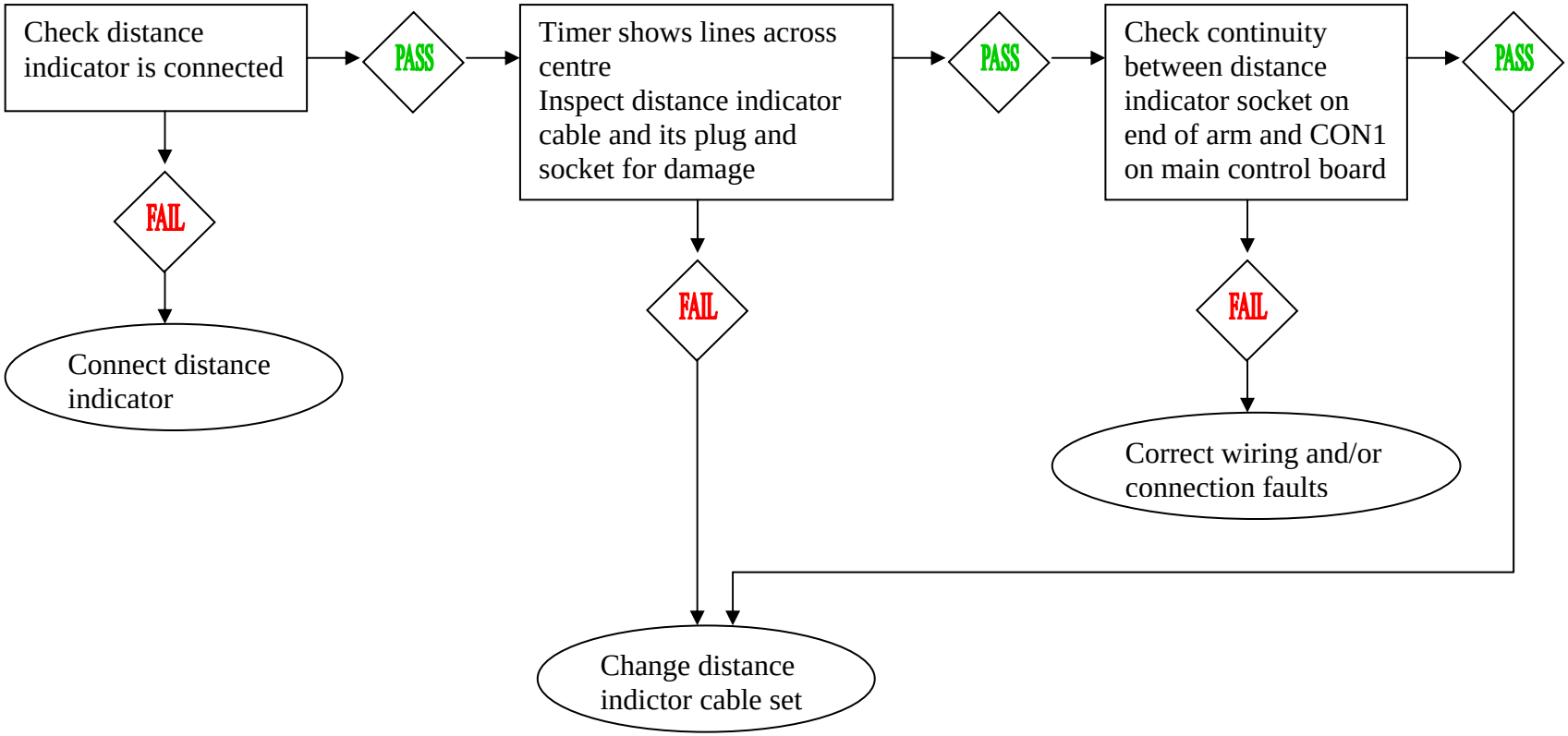
When checking IEC cable for continuity, the resistance across the Live and Neutral of the cable and lamp set should read ≥3.5Ω when cold and ≤16.0Ω just after use.

The Universal Power Module (UPM) is the black component situated approximately 1/3 of the way down the interior of the upright, marked D320.03.15 on reverse of board.

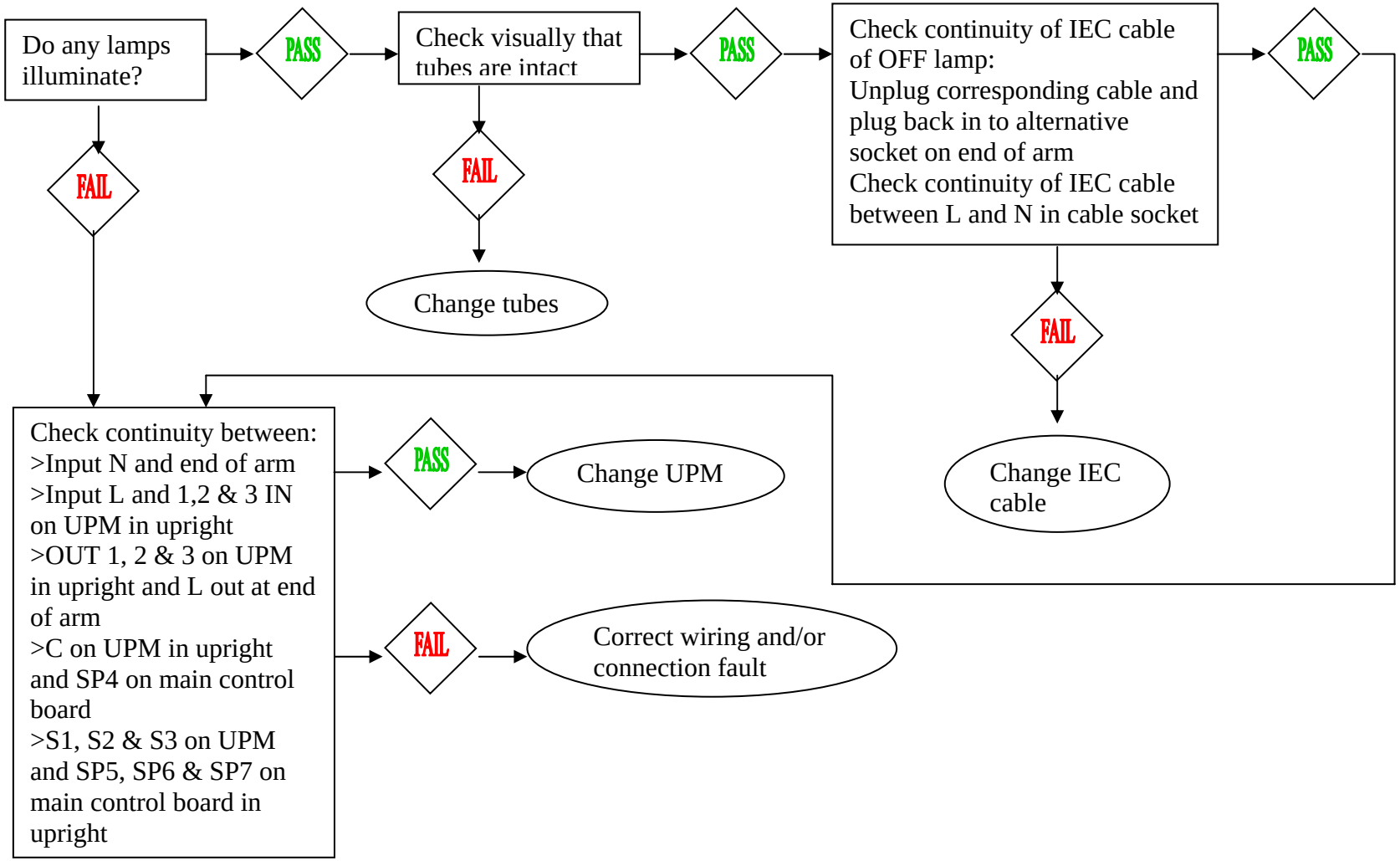
Does main timer display light up?


Check continuity from mains plug to transformer board in upright:
E pin on plug to E point in upright
L pin on plug to ON/OFF switch
Other side of ON/OFF switch to SP2 on transformer board
N pin on plug to SP1 on transformer board
PASS
Check continuity from SP3 & SP4 on transformer board in upright to main control board fixed to fascia
PASS
Swap main control board
FAIL
Correct wiring and/or connection faults
FAIL
Check following connections and continuity:
>Fuse on transformer board in upright
>Transformer windings
>L IN to L OUT in filter
>N IN to N OUT in filter
Also check for short circuit between all L and N in filter
PASS
Replace faulty components
FAIL
Correct wiring and/or connection faults

Does the unit display time setting and stay silent when switched on?


Check distance indicator is connected
PASS
Timer shows lines across centre
Inspect distance indicator cable and its plug and socket for damage
PASS
Check continuity between distance indicator socket on end of arm and CON1 on main control board
PASS
FAIL
Connect distance indicator
FAIL
FAIL
Correct wiring and/or connection faults
Change distance indictor cable set

Do all Infra Red lamps illuminate during Flashoff?


Do any lamps illuminate?
PASS
Check visually that tubes are intact
PASS
Check continuity of IEC cable of OFF lamp:
Unplug corresponding cable and plug back in to alternative socket on end of arm
Check continuity of IEC cable between L and N in cable socket
PASS
FAIL
FAIL
Change tubes
FAIL
Change IEC cable
Check continuity between:
>Input N and end of arm
>Input L and 1,2 & 3 IN on UPM in upright
>OUT 1, 2 & 3 on UPM in upright and L out at end of arm
>C on UPM in upright and SP4 on main control board
>S1, S2 & S3 on UPM and SP5, SP6 & SP7 on main control board in upright
PASS
Change UPM
FAIL
Correct wiring and/or connection fault

REPAIR PROCEDURES

Procedure 1- FRONT PANEL REMOVAL

Ensure unit is disconnected from mains supply.
Remove cassette assembly.
Remove upright from base to allow the plastic side strips to be removed. Undo the four screws holding the top cap in position. Remove the four remaining screws holding the front fascia in position. The front fascia can now pivot forward allowing access to the components inside.

Procedure 2 – MAINS CABLE REPLACEMENT

Ensure unit is disconnected from mains supply (remove mains plug from the supply).
Remove the six screws that hold the cable gland cover to the upright column. The cover can be eased away from the column exposing the connections to the mains cable. Disconnect the mains input cable from the terminal block.
Release the clamping screws on the cable clamps and cut the tie wrap holding the cable to the terminal block. Disconnect the earth cable from the cover earth stud. Undo the clamping nut on the spiral gland to release the old mains lead.

To refit the new mains cable, ensure the new cable is the same type as the original. Strip the sheath 270mm back from the end before inserting into the cable gland. Fasten the cable clamp onto the sheath of the mains cable allowing a minimum of 5mm to extend beyond the clamp. Refit the cable tie to tidy cables. Tighten nut of spiral gland. Connect as below:

(S221d, S240d)
Brown - Live (Terminal marked L)
Blue - Neutral (Terminal marked N)
Green/Yellow - Earth (Terminal marked E)

(S321d, S521d)
Brown - Phase 1 (Terminal marked L1)
Black - Phase 2 (Terminal marked L2)
Blue - Phase 3 (Terminal marked L3)
Green/Yellow - Earth (Terminal marked E)

(S214d, S310d, S516d)
Black - Live (Terminal marked L)
White - Neutral (Terminal marked N)
Green - Earth (Terminal marked E)

Procedure 3 – CASSETTE CORD REPLACEMENT*

*The Cassette Cord is usually supplied as part of a spares package, complete with Strain Relief Plate and associated components. The following procedure details the steps of replacing just the Cassette Cord itself.
Ensure unit is disconnected from the mains supply.

Disconnect Cassette Cords from IEC Sockets. Remove the affected I.R. Cassette Assembly from the end of the arm by removing the ratchet lever. Carefully support I.R. Cassette Assembly and slide this unit off the pivot bolt.
Examination of the rear of the affected I.R Cassette will show the cord entering the unit via a spiral gland mounted on a Strain Relief Plate. Drill out the four rivets which hold the Strain Relief Plate to the Back Mesh, and the central rivet that holds the Earth Terminal to the Strain Relief Plate.
A record should be made of the connections to the Terminal Block before removing old cable.
A pair of Heyco hand pliers are usually required for removing and fitting the Spiral Gland but normal can be used if necessary. Fit new cord. Re-attach the cassette earth terminal. Rivet the Strain Relief Plate onto Back Mesh. The unit is now ready for re-assembly

Procedure 4 – UPM REPLACEMENT (UNIVERSAL POWER MODULE)

Ensure unit is disconnected from the mains supply.
See procedure 1 for removal of front panel.
Do not disconnect the old UPM until the new one is in place. The UPM can be swapped by first removing the two securing screws. The new UPM can then be fixed into position, (once thermally conductive paste has been applied). The cabling can then be swapped over, being careful to connect correctly.

Procedure 5 – MAIN CONTROL PCB REPLACEMENT

Ensure unit is disconnected from the mains supply.
See procedure 1 for removal of front panel.
Do not disconnect the old control PCB until the new one is in place. Undo the M3 nut located near the six pin connector. Undo the six screws fixing the control PCB to the front panel. Remove knobs on front of panel. Fix new control PCB in position and carefully swap the interconnections from the old control PCB to the new.

Procedure 6 – IEC SOCKET REPLACEMENT

Ensure unit is disconnected from mains supply.
Remove cassette assembly / pivot bolt assembly.
To remove the plastic covers at the end of the arm undo the 8 screws fixing them.
Remove Plastic Caps, which cover bolts that attach socket housing to arm ‘U’ Channel. Slacken M10 Lock-nuts sufficiently to allow the Socket Housing to slide off and give access to the sockets. Do not use excessive force or the wires will be damaged.
Take a note of the wiring connections to the damaged socket then remove wires and unclip socket. Clip the new socket into housing and refit cables. Refit Socket Housing to arm.

Procedure 7 – GAS STRUT REPLACEMENT

Ensure unit is disconnected from mains supply.
Check rating of replacement Gas Strut is correct (if in doubt, check rating on old gas strut).
Remove cassette assembly, remove upright from base and remove side strips.
Remove the self – tapping screws that secure the Plastic Cap on the top of Upright. Remove the 2 plastic covers from the side of the Upright.
Carefully support the cassette assembly on a stand or bench.

Remove the capped starlock from one side of the pin assembly that fasten the Gas Strut to the support arm. (A new capped starlock will probably be needed)
Push out the lower Gas Strut Pivot Pin. Rotate the Gas Strut and remove from the Upright.
Replace with a TRISK pre-prepared Gas Strut. Replace the lower Gas Strut Pivot Pin.
Adjust the support arm height to suit the new Gas Strut setting. Reassemble holding collar arrangement and fix in place with new split pin.
CAUTION: Once fitted, Gas Strut should only be tested with I.R. Cassettes in place.
Check that Gas Strut operation is satisfactory.

Procedure 8 – I.R EMITTER REPLACEMENT

Check that replacement emitter has correct voltage and wattage ratings.. Check old emitter end caps if in doubt.
Ensure unit is disconnected from mains supply.
Remove wire Grille from front of I.R Cassette.
Remove Self Tapping Screws which hold Side Reflectors onto cassette. A small screwdriver will be necessary to lift the side reflector from the cassette.
When the Side Reflectors are removed, take note of the cable positions before removing old emitter.
The In-Line connector can be separated by hand, but a better solution is to use two pairs of pliers. One to hold each connector when separating the wires.
Fit new Infra-Red Emitter to sockets in cassette. To avoid touching the ruby sleeve with bare hands use tissue paper when handling the emitter.
Reconnect Infra-Red Emitter to cassette wiring, taking care to replace the wires in the original positions.
Fit side reflectors then clean ruby sleeve and Reflectors with IPA or Methylated Spirits.
Refit Grille.
Allow 15 minutes for the solvent to dissipate before switching on.

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